

NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

SEDIMENT BASIN, (NUMBER)

Code 350

DEFINITION

A basin constructed to collect and store debris or sediment.

PURPOSE

To preserve the capacity of reservoirs, ditches, canals, diversions, waterways, and streams; To prevent undesirable deposition on bottom lands and developed areas; To trap sediment originating from construction sites; and To reduce or abate pollution by providing basins for deposition and storage of silt, sand, gravel, stone, agricultural wastes, and other debris.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where physical conditions or land ownership preclude treatment of a sediment source by the installation of erosion control measures to keep soil and other material in place or where a sediment basin offers the most practical solution to the problem. It may be used as a temporary measure until areas above the basin are permanently protected by vegetative or mechanical measures.

This practice also applies to the trapping and temporary storing of animal waste from open lots.

FEDERAL, STATE, AND LOCAL LAWS

This standard is in addition to all federal, state, and local laws governing waste management, pollution abatement, and health and safety. The owner shall be responsible for obtaining all required

permits and for compliance with such laws and regulations. Certification of compliance with this standard and specification **DOES NOT** ensure compliance with the other federal, state, and local requirements. Some of the state laws and regulations are filed in Chapter 1, Agricultural Waste Management Field Handbook (AWMFH).

Any work involving the discharge of dredged or fill material into wetlands or other waters of the United States may require a permit according to Section 404 of the Clean Water Act.

The Iowa Department of Natural Resources, Environmental Protection Division, requires construction and operation permits for certain types of animal feeding operations.

PLANNING CONSIDERATIONS FOR AGRICULTURAL WASTE MANAGEMENT SYSTEMS

The size and type of solids suspended in the liquid has a major effect on the efficiency of a sediment basin to remove the solids and the amount of time necessary to achieve the desired amount of solids removed.

Beef and dairy solids generally settle faster and more efficiently than solids from swine manure. A sediment basin that is planned to remove solids from swine manure (especially from swine raised on concrete) may not perform well enough to meet the producer's objectives. The total containment option may be more satisfactory. Separation of solids from swine manure of swine raised on earthen lots may be accomplished satisfactorily by

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a sediment basin if the animals are not over-crowded.

For the minimum required separation distance between a sediment basin and wells, refer to Chapter 1, AWMFH.

Access to the sediment basin for purposes of cleanout may be accomplished by a ramp, drive through wall opening (closed with a filtering structure during normal operation), or other acceptable means.

Adequate land or storage must be available for proper nutrient application. Clean water shall be excluded from waste collection areas to the fullest extent practical.

CRITERIA

The capacity of the sediment basin should equal the volume of sediment or agricultural wastes expected to be trapped at the site annually plus adequate capacity to control the runoff from the design storm.

If it is determined that periodic removal of sediment or agricultural waste will be practicable, the sediment capacity may be proportionately reduced but not less than the minimum capacity of 0.5 inch from the drainage area.

Fabricated or concrete structures shall have a minimum of 0.5-foot freeboard. Earthen embankments shall have a minimum of 1-foot freeboard. Freeboard is measured from the design storage volume (sediment + storm runoff) to the top of the facility.

The design of dams, spillways, and drainage facilities shall be according to NRCS Conservation Practice Standards for Pond (378) and Grade Stabilization Structure (410) or according to the requirements in Technical Release 60, as appropriate for the class and kind of facility being considered.

Temporary basins having drainage areas of 5 acres or less and a total embankment height of 5 feet or less may be designed with less conservative criteria if conditions

warrant. The embankment shall have a minimum top width of 4 feet and side slopes of 2:1 or flatter. An outlet shall be provided of earth, pipe, stone, or other devices adequate to keep the sediment in the basin and to handle the 10-year, 24-hour storm discharge without failure or significant erosion.

Provisions shall be made for draining sediment pools if necessary for safety and pest control. Fencing and other safety measures shall be installed as necessary to protect the public from floodwater, soft sediment, and agricultural wastes. Consideration shall be given to good visual resource management.

URBAN OR DEVELOPING AREAS AND CONSTRUCTION SITES

The minimum sediment storage volume shall be 0.5 watershed inches (0.5 acre-inches of sediment per acre of drainage area).

Sediment basins shall be cleaned out when the effective sediment storage capacity drops below 0.2 watershed inches. The elevation corresponding to this level shall be determined and given in the design data as a distance below the principal spillway crest or other convenient point of reference. (Storage of 0.5 watershed inches = 67 cubic yards or 1815 cubic feet per acre of watershed. Storage of 0.2 watershed inches = 27 cubic yards or 726 cubic feet per acre of watershed).

Temporary basins having drainage areas of 30 acres or less may be designed according to Water and Sediment Control Basin (638). When the watershed above a temporary basin has become stabilized, the basin should be removed. Removal shall include shaping, re-vegetating, and stabilizing the area occupied by the basin.

WASTE MANAGEMENT SYSTEM

A sediment basin can be used as a solids settling facility for an animal waste

management system. It is normally used to settle solids from feedlot runoff. Basins are not intended to be solids storage (stacking) facilities. To facilitate cleanout, concrete is recommended within the settling area.

A minimum of 450 square feet of basin surface area shall be provided for each cfs of runoff resulting from a 10-year, 1-hour storm.

A minimum travel (flow) distance of 40 feet is recommended. Sediment basins are most effective when the inlet and outlet are as far apart as possible. The sediment basin may form the lower boundary of a lot although this should not be encouraged because the movement of livestock in the ponded area reduces the sediment removal efficiency.

Accumulated runoff in the basin shall be discharged in a manner that will not degrade soil, air, or water resources. The basin will be designed to allow free drainage of water from the accumulated solids between precipitation events.

Sediment capacity for basins that contain the sediment from feedlots that are cleaned less often than once per month should be at least 1.2 inches of sediment. The sediment capacity for basins from feedlots that are cleaned at least once per month should be no less than 0.5 inches of sediment.

Waste from feedlots should not be scraped into the sediment basin for storage. Consider using a solids stacking structure or short term storage basin to store waste scraped from lots. See Waste Storage Facility, Practice Standard 313.

Minimum liquid storage capacity for a basin receiving runoff from a feedlot shall be 50% of the 10-year, 1-hour storm runoff volume.

PLANS AND SPECIFICATIONS

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the

requirements for applying the practice to achieve its intended use.

The following list of Construction Specifications is intended as a guide to selecting the appropriate specifications for each specific project. The list includes most but may not contain all of the specifications that are needed for a specific project:

- IA-1 Site Preparation
- IA-3 Structure Removal
- IA-5 Pollution Control
- IA-6 Seeding and Mulching for Protective Cover
- IA-11 Removal of Water
- IA-21 Excavation
- IA-23 Earthfill
- IA-24 Drainfill
- IA-26 Salvaging and Spreading Topsoil
- IA-27 Diversions
- IA-31 Concrete
- IA-32 Concrete for Nonstructural Slabs
- IA-45 Plastic (PVC, PE) Pipe
- IA-81 Metal Fabrication and Installation
- IA-83 Timber Fabrication and Installation
- IA-92 Fences

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed that is consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for its design. The plan shall contain the operational requirements for emptying the facility, such as the requirement that waste shall be removed and utilized at locations, times, rates, and volume in accordance with the overall waste management plan. In addition, the plan shall include the requirement that following storms, waste shall be removed at the earliest environmentally safe period to ensure that

sufficient capacity is available to accommodate subsequent storms.

Operation of the basin shall be performed according to the written plan provided for in the overall waste management plan.

Necessary maintenance will be performed in a timely manner in order to protect the facility and its ability to perform as planned.